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☐ Applicant claims small entity status. See 37 CFR 1.27

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First Named Inventor JONNE SOININEN
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1. BASIC FILING, SEARCH, AND EXAMINATION FEES

Application Type	FILING FEES		SEARCH FEES		EXAMINATION FEES		Fees Paid (\$)
	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	
Utility	300	150	500	250	200	100	
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

2. EXCESS CLAIM FEES

Fee Description	Fee (\$)	Small Entity Fee (\$)
Each claim over 20 (including Reissues)	50	25
Each independent claim over 3 (including Reissues)	200	100
Multiple dependent claims	360	180

Total Claims Extra Claims Fee (\$) Fee Paid (\$) Multiple Dependent Claims Fee (\$) Fee Paid (\$)

- 20 or HP = x =

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Indep. Claims Extra Claims Fee (\$) Fee Paid (\$)

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Client Reference: 2990421US/Ä/mo

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Confirmation No.: 5013

SOININEN ET AL.

Application No.: 09/940,577

Group Art Unit: 2155

Filed: August 29, 2001

Examiner: L. WANG

Title: IP ROUTING OPTIMIZATION IN AN ACCESS NETWORK

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BRIEF ON APPEAL

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I. INTRODUCTION

This Appeal is from an Office Action mailed November 25, 2005, finally rejecting claims 1-4, 10, 21-22 and 35 of the above-identified patent application. This brief is in furtherance of the Notice of Appeal filed on March 27, 2006 and the Notice of Panel Decision from Pre-Appeal Brief Review mailed on May 19, 2006 indicating that the present application remained under appeal because there is at least one actual issue for appeal.

A. Real Party in Interest - 37 C.F.R. §41.37(c)(1)(i)

The real party in interest for this Appeal and the present patent application is Nokia Networks Oy, by way of an Assignment recorded on August 29, 2001, in the U.S. Patent and Trademark Office at Reel 012126, Frame 0746.

B. Statement of Related Appeals and Interferences - 37 C.F.R. §41.37(c)(1)(ii)

There are presently no appeals or interferences known to Appellant, Appellant's representatives, or the Assignee, which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

C. Status of Claims - 37 C.F.R. §41.37(c)(1)(iii)

Claims 1-4, 10, 21-22 and 35 are pending in the application. The rejection of claims 1-4, 10, 21-22 and 35 is appealed herein. Claims 1, 10, 21 and 35 are independent. Claims 2-4 depend from claim 1, and claim 22 depends from claim 21.

D. Status of Amendments - 37 C.F.R. §41.37(c)(1)(iv)

An Amendment was filed in the U.S. Patent and Trademark Office on January 13, 2005. An Amendment and a Response to Restriction Requirement was filed on October 6, 2005. A Pre-Appeal Brief Conference Request was filed on March 27, 2006. All claim amendments have been entered and are of record.

II. SUMMARY OF CLAIMED SUBJECT MATTER - 37 C.F.R. §41.37(c)(1)(v)

A. Features of the Invention

The invention relates to a system configured to optimize the routing of macro level traffic, such as internet-type protocol traffic, in an access network. The access network may be a radio access network and is configured to support mobile IP protocol. Mobile IP is a protocol which allows laptop computers or other mobile computer units (also referred to as "mobile nodes") to roam between various sub-networks at various locations--while maintaining internet and/or WAN connectivity. Without Mobile IP or related protocol, a Mobile Node would be unable to stay connected while roaming through various sub-networks.

In an access network that supports a mobile IP protocol, a mobile unit or mobile node might perform several handovers between access nodes of the network during a long session. These several handovers may cause inefficient mobile IP routing.

In one feature of the invention, a support node, or more generally any access node, which is the target of a handover during a session, is arranged to check the optimal routing in respect to macro mobility management. For that purpose, the access node is aware of the most preferred mobility entity, normally the closest one, which should be used. A mobility entity may be any entity which provides a point of attachment on the macro mobility level, such as a mobility agent in the mobile IP-type mobility management. In a handover situation the system, preferably the access node, checks whether there is a more preferred mobility entity which should substitute for the current mobility entity of the session. If there is no preferred mobility entity for that access node, or the preferred mobility entity appears to be the same as the current mobility entity of the session, the current mobility entity is maintained. However, if there is a more preferred mobility entity for that access node and the preferred mobility entity is not the same as the current mobility entity, the connection (*e.g.*, a PDP context) to the current mobility entity is preferably closed (released), and a new connection (*e.g.*, PDP context) to the preferred mobility entity of the respective access node is opened. Registration in accordance with the specific macro mobility management scheme can be carried out.

B. The Independent Claim on Appeal

The following explanation of the claimed subject matter, with reference to the specification and drawings, is for explanation only. The invention is not limited to the disclosed embodiments.

1. Claim 1

Independent claim 1 recites a method of providing macro mobility management for a mobile node in an access system. The access system comprises a plurality of mobile nodes (FIG. 1, page 5, lines 35-36, page 36, lines 1-3), a first and a second access node serving said mobile nodes within first and second parts of the access system, respectively, (FIG. 1) at least one first gateway node for interfacing said first part of the access system with external networks (FIG. 1, page 9, lines 22-25), and a first mobility entity which is associated with said at least one first gateway node and arranged to provide macro mobility management routing services to the mobile nodes while registered to the first part of the access system (FIG. 1, page 9, lines 25-36, page 10, lines 1-36, page 11, lines 1-11). The method comprises establishing a session between one of said plurality of mobile nodes and a second party via said first access node and said first mobility entity (FIG. 1, page 11, lines 16-29); checking whether there is at least one second mobility entity to which the first access node can establish a connection as an alternative for the first mobility entity and which is more preferred for the first access node in respect to routing than said first mobility entity (FIGS. 2 and 3, page 11, lines 30-36, page 12, lines 1-36, page 13, lines 1-20); and reacting to said checking by A) maintaining a connection from said first access node to said first mobility entity if there is no second mobility entity which is more preferred than said first one (FIGS. 3 and 4, page 14, lines 11-22), and B) opening a new connection from said first access node to said second mobility entity if said more preferred second mobility entity is available, and initiating macro mobility management registration (FIGS. 2 and 3, page 12, lines 30-36 and page 13, lines 1-20).

2. Claim 10

Independent claim 10 recites an access system. The access system comprises a plurality of mobile nodes (FIG. 1, page 5, lines 35-36, page 36, lines 1-3), a first and a second access node serving said mobile nodes within first and second parts of the access system, respectively (FIG. 1); at least one first gateway node for interfacing said first part of the

access system with external networks (FIG. 1, page 9, lines 22-25); a first mobility entity which is associated with said at least one first gateway node and arranged to route a connection to any one of said mobile nodes while said mobile node is registered to the first part of the access system (FIG. 1, page 9, lines 25-36, page 10, lines 1-36, page 11, lines 1-11); a mechanism which checks whether there is a second mobility entity which is more preferred in respect to routing than said first mobility entity for said one access node (FIGS. 2 and 3, page 11, lines 30-36, page 12, lines 1-36, page 13, lines 1-20); and a mechanism which opens a new connection from one of said access nodes to said second mobility entity if said more preferred second mobility entity is available according to said checking (FIGS. 2-4, page 12, lines 30-36, page 13, lines 1-20 and page 14, lines 11-22), said mobile node being arranged to detect a change of attachment by means of said new connection and to initiate macro mobility management registration (FIGS. 2-4).

3. Claim 21

Independent claim 21 recites an access node for an access system. The access system comprises a plurality of mobile nodes (FIG. 1, page 5, lines 35-36, page 36, lines 1-3), access nodes serving said mobile nodes within respective parts of the access system (FIG. 1), at least two gateway nodes for interfacing the access system with external networks (FIG. 1, page 9, lines 22-25), and at least two mobility entities which are associated with different ones of said at least two gateway nodes and arranged to provide macro mobility management routing services to the mobile nodes while registered to the access system (FIG. 1, page 9, lines 25-36, page 10, lines 1-36, page 11, lines 1-11). The access node comprises means for checking, when a mobile node having a connection through another access node and a first mobility entity is accessing the system via said access node, whether there is another mobility entity which is more preferred in respect to routing than said first mobility entity (FIGS. 2 and 3, page 11, lines 30-36, page 12, lines 1-36, page 13, lines 1-20), and means responsive to said checking means for opening a new connection to said preferred other mobility entity if said more preferred other mobility entity is available (FIGS. 2-4, page 12, lines 30-36, page 13, lines 1-20 and page 14, lines 11-22).

4. Claim 35

Independent claim 35 is directed to a packet radio support node for a packet radio access system. The access system comprises a plurality of mobile nodes (FIG. 1, page 5, lines 35-36, page 36, lines 1-3), packet radio support nodes serving said mobile nodes within

respective parts of the access system, (FIG. 1) at least two gateway nodes for interfacing the packet radio access system with external networks (FIG. 1, page 9, lines 22-25), and at least two foreign agents which are associated with different ones of said at least two gateway nodes and arranged to provide macro mobility management routing services to the mobile nodes while registered to the packet radio access system (FIG. 1, page 9, lines 25-36, page 10, lines 1-36, page 11, lines 1-11). The packet radio support node comprises means for checking, when a mobile node having a connection through another packet radio access node and a first foreign agent is accessing the system via said packet radio access node, whether there is another foreign agent which is more preferred for said packet radio access node in respect to routing than said first foreign agent (FIGS. 2 and 3, page 11, lines 30-36, page 12, lines 1-36, page 13, lines 1-20); and means responsive to said checking means for opening a new connection to said preferred other foreign agent if said more preferred other foreign agent is available (FIGS. 2-4, page 12, lines 30-36, page 13, lines 1-20 and page 14, lines 11-22).

III. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL – 37 C.F.R. § 41.37(c)(1)(vi)

In the November 25, 2005 Final Office Action (hereinafter “the Final Office Action”), claims 1-4, 10, 21-22 and 35 were rejected under 35 U.S.C. §102(e) based on Leung (U.S. Pat. No. 6,195,705).

Thus, the ground of rejection to be reviewed on appeal is:

1) whether claims 1-4, 10, 21-22 and 35 are anticipated under 35 U.S.C. §102(e) based on Leung.

IV. ARGUMENT - 37 C.F.R. §41.37(c)(1)(vii)

A. The Law Regarding Anticipation Under 35 U.S.C. § 102(e)

35 U.S.C. §102(e) indicates that a person shall be entitled to a patent unless:

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

“A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Further, MPEP § 2131.02 states that “[t]he identical invention must be shown in as complete detail as is contained in the ... claim.” *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

B. Rejection Under 35 U.S.C. § 102(e)

1. The Cited Reference

a) Leung

Leung discloses a method and an apparatus for automatically backing up a Home Agent in Mobile IP. (*See, e.g.*, col. 1, lines 5-9 of Leung). Leung discloses that when a mobile node (*e.g.*, a mobile computer) is removed from its home base network and roams a remote network segment, the mobile node engages with the remote network segment. (*See, e.g.*, FIG. 1A and col. 1, lines 64-67 and col. 2, lines 1-5). Subsequently, the Foreign Agent (*i.e.* a router or other type of network connection device) of the remote network relays a registration to the Home Agent of the home base network and the Home and Foreign Agents negotiate the conditions of the Mobile Node's node attachment to the Foreign Agent of the remote network. (*See, e.g.*, FIG. 1A and col. 2, lines 10-19). When the Mobile Node 6 sends a message to a corresponding node from its new location, the output message from the Mobile Node is packetized and forwarded through the Foreign Agent of the remote network over the internet. (*See, e.g.*, FIG. 1A and col. 2, lines 20-26). If the corresponding network wishes to send a message to the Mobile Node attached to the remote network, it addresses that message to the IP address of the Mobile Node of the home base network and the packets are forwarded to the Home Agent of the home base network. (*See, e.g.*, FIG. 1A and col. 2, lines 27-35). The Home Agent then forwards these packets to the Mobile Network, which is attached to the remote network, via the Foreign Agent. (*See, e.g.*, FIG. 1A and col. 2, lines 35-40). Leung discloses that if the Home Agent fails or becomes inoperative, the Mobile Node attached to the remote network is left without the ability to (1) receive new internet messages addressed to it at network segment 12 and (2) register with other Foreign Agents. (*See, e.g.*, col. 2, lines 45-56). In effect, Mobile Node 6 is cut-off from internet connection when Home Agent 8 becomes inoperative. (*See, e.g.*, col. 2, lines 45-56). In order to solve this problem, Leung discloses backing up the active Home Agent of the home

base network with one or more standby router(s) or Home Agent(s). (*See, e.g.*, col. 3, lines 64-67 and col. 4, lines 1-3). The active and standby Home Agent(s) would share a virtual IP address. (*See, e.g.*, col. 3, lines 7-10 and lines 64-67). The mobility binding table (or a visitor table in the case of a foreign agent) between an active Mobility Agent and a standby Mobility Agent, which would back up the active Mobility Agent, would be synchronized so that the backup Home Agent would be able to handle internet communications via Mobile IP in case the active or primary Home Agent fails. (*See, e.g.*, col. 3, lines 26-27 and col. 4, lines 1-15).

2. Claims 1-4, 10, 21, 22 and 35 Are Novel Over Leung

a) Claim 1

It is respectfully submitted that Leung fails to disclose, teach or suggest all the features of claim 1. For example, Leung fails to disclose, teach or suggest a method of providing macro mobility management for a mobile node in an access system comprising, among other things, establishing a session between one of the plurality of mobile nodes and a second party via the first access node and the first mobility entity; checking whether there is at least one second mobility entity to which the first access node can establish a connection as an alternative for the first mobility entity and which is more preferred for the first access node in respect to routing than the first mobility entity; and reacting to the checking by A) maintaining a connection from the first access node to the first mobility entity if there is no second mobility entity which is more preferred than the first one, and B) opening a new connection from the first access node to the second mobility entity if the more preferred second mobility entity is available, and initiating macro mobility management registration.

Leung fails to disclose, teach or suggest an access system as recited in claim 1

Appellant respectfully submits that the appealed rejection is based on an erroneous interpretation of the different elements of Leung. In particular, the Final Office Action of November 25, 2005, (hereinafter “the Final Office Action”) alleged that FIG. 2B of Leung discloses an access system, as recited in claim 1, that comprises a plurality of mobile nodes, a first and a second access node serving said mobile nodes within first and second parts of the access system, respectively, at least one first gateway node for interfacing the first part of the access system with external networks, and a first mobility entity which is associated with the at least one first gateway node and arranged to provide macro mobility management routing

services to the mobile nodes while registered to the first part of the access system. (See paragraph 7 of the Final Office Action). Appellant respectfully disagrees.

FIG. 2B of Leung merely shows a diagram of two Mobile IP network segments 14 and 212 and associated environment. (See, e.g., col. 5, lines 66-67 of Leung). The segment 212 is divided into two groups 214, 216, that each include a virtual Home Agent (HAV1 202, HAV2 208) and a Home Agent (HA 1 206, HA 2 204). Leung discloses that a standby Home Agent for group 214 is a Home Agent (HA 2) 204, which normally serves as the active Home Agent for the group 216. (See, e.g., col. 8, lines 44-67 of Leung).

However, contrary to what is asserted in the Final Office Action, (a) Home Agents 204 and 206 do not correspond to different access nodes of an access system and (b) groups 214 and 216 do not correspond to different access parts of an access system. Home Agents 204 and 206 are merely Mobile IP entities attached to the same network section 212. (See, e.g., col. 8, lines 45-47 of Leung). Each home agent HA1 206, HA2 204 has a dedicated home agent address which is used by the mobile nodes (e.g., 6 or 27) assigned to this home agent. Groups 214 and 216 represent the groups of mobile nodes. However, each mobile node is associated with its corresponding Home Agent regardless of its location. For example, mobile node 27, which belongs to group 216, is associated with home agent HA2 204, regardless of its location. That is, mobile node 27 is associated with home agent HA2 204 even if mobile node 27 is located in group 214 of the same network section 212 or in the foreign network segment 14. Similarly, mobile node 6, which belongs to group 216, is associated with home agent HA1 206, regardless of its location. Accordingly, in view of the facts that (a) the mobile nodes 6, 27 are always associated with their corresponding Home Agent regardless of their physical location (e.g., in groups 214, 216) and (b) Home Agents 204 and 206 are merely Mobile IP entities attached to the same network section 212, groups 214 and 216 collectively form one access part. As a result, Home Agents 204 and 206 cannot correspond, in any way, to different access nodes of an access system.

The Examiner identified virtual Home Agent HAV1 202 and Home Agent HA1 206 as being, respectively, the first mobility entity and the first access node of claim 1. Appellant respectfully disagrees with this determination at least because virtual Home Agent HAV1 202 and Home Agent HA1 206 do not correspond to two separate network entities. Contrary to what is asserted in the Final Office Action, virtual Home Agent HAV1 202 is not a first mobility entity. As clearly explained by Leung, “HAV1 is not a physical router, but a facade adopted by one of the routers/Home Agents in the groups – and only while that router serves

as the active Home Agent.” (See, e.g., col. 7, lines 43-46 of Leung, emphasis added). Specifically, Leung discloses that the routers/Home Agents on the network section 212 assume the role of a virtual Home Agent. At any one time, one of the routers in group 214 (i.e., Home Agent 206 in FIG. 2B of Leung) assumes the state of active Home Agent and, therefore, emulates the virtual Home Agent. (See, e.g., col. 7, lines 37-41 of Leung). Mobile nodes and Foreign Agents know only the virtual Home Agent, regardless of which physical router/Home Agent is currently emulating it. (See, e.g., col. 7, lines 41-45 of Leung). For example, with reference to FIG. 2B of Leung, the mobile nodes and Foreign Agents know only Virtual Home Agent HAV1 202 in group 214, regardless of whether Home Agent HA1 206 or HA2 204 (acting as a backup) is currently emulating it. As such, Home Agent HA1 206 and HA2 204 collectively assume the role of virtual Home Agent HAV1 202. (See, e.g., col. 7, lines 37-41 and col. 8, lines 44-67 of Leung). Accordingly, the Examiner’s determination that virtual Home Agent HAV1 202 and Home Agent HA1 206 correspond to two different existing entities, namely a mobility entity and a first access node, is improper and clearly contradicts Leung’s teachings.

The Final Office Action further alleged that router R1 in FIG. 2B of Leung corresponds to the at least one first gateway node for interfacing the first part of the access system with external networks, as recited in claim 1. (See, e.g., paragraph 7 of the Final Office Action). The Office Action also alleged that FIG. 2B of Leung shows a first mobility entity (identified in the Final Office Action as the “virtual Home Agent HAV1 202”) associated with the first gateway (identified in the Final Office Action as element router “R1” of Leung) of claim 1. (See, e.g., paragraph 7 of the Final Office Action). Appellant respectfully disagrees with this determination. As mentioned previously, the virtual home agent HAV1 (i.e., item 202) is a virtual facade that is emulated by router/Home Agent 206, which router/Home Agent 206 has already been identified by the Examiner as being the first access node of claim 1. The configuration asserted by the Office Action does not in any way correspond to the network architecture defined in claim 1.

Leung fails to disclose, teach or suggest “establishing a session between one of the plurality of mobile nodes and a second party via the first access node and the first mobility entity”

The Office Action alleged that Leung discloses this step by virtue of describing, in Figure 2B, a “session ... between item 202 and item 10 via item 206.” (See, e.g.,

paragraph 7a of the Final Office Action). Appellant respectfully disagrees with this determination.

The Examiner identified Home Agent HA1 206, virtual Home Agent HAV1 202 and Foreign Agent 10 as being, respectively, “the first access node,” the “first mobility entity” and the “second party” of claim 1.

However, unlike claim 1, FIG. 2B of Leung merely shows a tunnel, *i.e.*, a transfer of packets, provided between Home Agent 206 and Foreign Agent 10 when the mobile node 6 is removed from the network segment 212 and attached to the network segment 14. This tunnel or transfer of packets is between two mobile IP network entities, not between a mobile node and a second party via the first access node and the first mobility entity, as required by claim 1.

Furthermore, even assuming the Examiner is correct in interpreting the Home Agent HA1 206, virtual Home Agent HAV1 202 and Foreign Agent 10 as being, respectively, “the first access node”, the “first mobility entity” and the “second party” of claim 1, which Appellant does not concede, FIG. 2B of Leung would still not disclose a session between one of the plurality of mobile nodes and a second party via the first access node and the first mobility entity, as mandated by claim 1. Communications in Leung between the Foreign Agent 10 and the Home Agent 206 occur only when the mobile node 6 is attached to the network section 14. (*See, e.g.*, FIG. 2B and col. 1, lines 64-67 and col. 2, lines 1-44 of Leung). Specifically, communications between the Foreign Agent 10 and the Home Agent 206 (and vice versa) occur during the registration process of the mobile node 6 to the network section 112 or when packets are transmitted from the Home Agent 206 to the mobile node 6 via the Foreign Agent 10 (*i.e.*, after registration of the mobile node 6). (*See, e.g.*, FIG. 2B and col. 1, lines 64-67 and col. 2, lines 1-44 of Leung). However, none of these configurations would provide a session between the mobile node 6 (identified in the Final Office Action as the “one of the plurality of mobile nodes”) and the Foreign Agent 10 (identified in the Office Action as the “second party”) via the Home Agent HA1 206 (identified in the Final Office Action as the “first access node”) and the virtual Home Agent HAV1 202 (identified in the Final Office Action as the “first mobility entity”), as mandated by claim 1. Clearly, the Examiner has failed to show a session as recited in claim 1.

In addition, and as noted above, item 202 is a virtual Home Agent that is emulated by router/Home Agent 206. Thus, the virtual Home Agent HAV1 202 resides within the

router/Home Agent 206 and is not a network entity that is separate from the router/Home Agent 206. Therefore, the Examiner's determination that the Home Agent HA1 206 and the virtual Home Agent HAV1 202 are, respectively, the first access node and the first mobility entity is improper. Consequently, by virtue of disclosing that the Home Agent 206 forms/emulates the virtual Home Agent HAV1 202, the Examiner is in error to state that Leung discloses a session between a mobile node and a second party via two separate network entities, *i.e.*, the first access node and the first mobility entity.

Leung fails to disclose, teach or suggest checking whether there is at least one second mobility entity to which the first access node can establish a connection as an alternative to the first mobility entity and which is more preferred for the first access node in respect of routing than said first mobility entity

In contrast to claim 1, Leung merely discloses in the embodiment of FIG. 2B that the router/Home Agent HA2 204 starts emulating the virtual Home Agent HAV1 202 only if the router/Home Agent HA1 206 (in which the virtual home agent HAV1 resides and is originally emulated) fails. (*See, e.g.*, col. 8, lines 55-64 of Leung). Conversely, the router/Home Agent 206 starts emulating the virtual Home Agent HAV2 only if the router/Home Agent 204 fails. (*See, e.g.*, col. 8, lines 55-64 of Leung). However, there are no teachings or suggestions anywhere in Leung, much less in the embodiment of FIG. 2B of Leung, as to checking whether a second mobility entity, to which the first access node can establish a connection as an alternative to the first mobility entity, is more preferred than the first mobility entity.

The Examiner alleged at paragraph 7b of the Final Office Action that Leung discloses “checking whether there is at least one second mobility entity (item 208) to which the first access node can establish a connection as an alternative (standby Mobile) for the first mobility entity and which is more preferred for the first access node in respect of routing than said first mobility entity (item 202) (Col 4 lines 27-39).” Appellant respectfully disagrees with this determination.

The Examiner identified virtual Home Agent HAV2 208, Home Agent HA1 206, virtual Home Agent HAV1 202 as being, respectively, the “second mobile entity,” “the first access node” and the “first mobility entity” of claim 1. However, even assuming the Examiner's interpretation of the various elements of Leung is correct, which Appellant does not concede for at least the same reasons provided above, Leung fails to teach or suggest

providing an alternative connection between the Home Agent HA1 206 and the virtual Home Agent HAV2 208 in the event this connection is more preferred than the connection between the Home Agent HA1 206 and the virtual Home Agent HAV1 202, as asserted by the Examiner.

Leung merely discloses that the Home Agent 206 and Home Agent 204 emulate, respectively, the virtual Home Agent HAV1 202 the virtual Home Agent HAV2 208. As such, contrary to what is stated in the Final Office Action, there is no “connection,” but merely an “emulation”, between a virtual Home Agent HAV1 202 and the Home Agent HA1 206 or between the Home Agent HA1 206 and the virtual Home Agent 208.

Further, Leung merely discloses that the Home Agent HA2 204 is backed up by the Home Agent HA1 206 if the Home Agent HA2 fails. In such a case, the Home Agent HA1 204 emulates the virtual Home Agent 208. However, such backup operation does not mean, in any way, that the new emulation of the virtual Home Agent HAV2 208 by the Home Agent HA1 206 is an “alternative” to the emulation of the virtual Home Agent HAV1 202 by the Home Agent HA1 206, as contended by the Examiner. To the contrary, Leung clearly discloses that the backup Home Agent still maintains its role in servicing its own group. (See, e.g., col. 8, lines 55-59 of Leung). Therefore, in FIG. 2B of Leung, the Home Agent HA1 206 (identified as “the first access node” of claim 1) must still emulate the virtual Home Agent HAV1 202 (identified as “the first mobility entity” of claim 1) to maintain a connection to the mobile node 6 even though it also emulates the second virtual Home Agent HAV2 208. As such, the emulation of the virtual Home Agent HAV2 208 (identified as “the second mobility entity” of claim 1) is clearly not an alternative to the emulation of the virtual Home Agent HAV1 202 (identified as “the first mobility entity” of claim 1).

Thus, Leung is silent as to an alternative connection between an access node and a second mobility entity, as recited in claim 1.

Leung fails to disclose, teach or suggest reacting to said checking by A) maintaining a connection from said first access node to said first mobility entity if there is no second mobility entity which is more preferred than said first one, and B) opening a new connection from said first access node to said second mobility entity if said more preferred second mobility entity is available, and initiating macro mobility management registration

As discussed above, Leung is clearly silent as to establishing an alternative connection between an access node and a second mobility entity, as recited in claim 1. Leung also fails to disclose, teach or suggest checking a more preferred connection between an access node and a second mobility entity or providing a backup Home Agent when the active Home Agent fails.

Furthermore, Leung clearly fails to teach or suggest opening a new connection from the first access node (identified in the Final Office Action as being the Home Agent HA1 206) to the second mobility entity (identified in the Final Office Action as being the virtual Home Agent HAV2 208) if the more preferred second mobility entity (identified in the Final Office Action as being the virtual Home Agent HAV2 208) is available, and initiating macro mobility management registration, as recited in claim 1. Rather, Leung discloses that the Home Agent HA1 206 (identified as “the first access node”) must emulate the virtual Home Agent HAV2 208 (identified as “the second mobile entity”) when the Home Agent HA2 204 fails. (See, e.g., FIG. 2B and col. 8, lines 62-65 of Leung), which is different from the above identified features of claim 1.

For at least these reasons, Leung cannot anticipate claim 1. Therefore, the rejection of claim 1 must be withdrawn.

b) Claim 2

Claim 2 is patentable over Leung at least by virtue of its dependency from claim 1 and for the additional features recited therein. In particular, Leung is clearly silent as to “rerouting the session via said second access node in response to a movement of said one of mobile nodes to said second part of the access system.”

The Examiner interpreted the “session” of claim 1 as being between the virtual Home Agent HAV1 202 and the Foreign Agent 10 via the Home Agent HA1 206 (identified as the “first access node”). The Examiner identified the Home Agent HA2 204 as being the “second access node” of claim 1. As a result, in accordance with the Examiner’s reasoning, Leung would disclose rerouting the session (between the virtual Home Agent HAV1 202 and the Foreign Agent 10 via the Home Agent HA1 206) via the Home Agent HA2 204 in response to a movement of the mobile node 6 to group 216 (identified as the second part of claim 1) of the access system. However, Leung is clearly silent as to these features.

In Leung, each mobile node is associated with its corresponding Home Agent regardless of its location. For example, mobile node 27, which belongs to group 216, is associated with home agent HA2 204, regardless of its location. That is, mobile node 27 is associated with home agent HA2 204 even if mobile node 27 is located in group 214 of the same network section 212 or in the foreign network segment 14. Similarly, mobile node 6, which belongs to group 216, is associated with home agent HA1 206, regardless of its location. As such, the fact that mobile node 6 is moved from group 214 to group 216 does not mean in any way that a session is rerouted to Home Agent 202 in response to movement of the mobile node 6 in group 216. Thus, the mobile node 6 will remain associated with its Home Agent HA1 206 regardless of its location so long as the Home Agent HA1 206 is active. As such, Leung does not disclose, teach or suggest the features of rerouting a session in response to a movement of the mobile node, as recited in claim 2.

Accordingly, for at least these reasons, Leung cannot anticipate claim 2. Therefore, the rejection of claim 2 must be withdrawn.

c) Claim 3

Claim 3 is patentable over Leung at least by virtue of its dependency from claim 1 and for the additional features recited therein. In particular, Leung is clearly silent as to “closing the connection from said first access node to said first mobility entity when said more preferred second mobility entity is available.”

As mentioned previously, the Examiner identified virtual Home Agent HAV2 208, Home Agent HA1 206, and virtual Home Agent HAV1 202 as being, respectively, the “second mobile entity,” “the first access node” and the “first mobility entity” of claim 3.

However, there are no teachings or suggestions anywhere in Leung as to closing a connection from the Home Agent HA1 206 to the virtual Home Agent HAV1 202 when the virtual Home Agent HAV2 208 is available.

First, as mentioned previously, Leung does not disclose any “connection,” but merely “emulation,” between a virtual Home Agent HAV1 202 and the Home Agent HA1 206 or between the Home Agent HA1 206 and the virtual Home Agent 208.

Second, Leung is completely silent as to the possibility of “closing” an emulation between the Home Agent HA1 206 (identified in the Final Office Action as being “the first

access node” of claim 1) and the virtual Home Agent HAV1 (identified in the Final Office Action as being “the first mobility entity” of claim 1) when the virtual Home Agent HAV2 208 (identified in the Final Office Action as being “the second mobility entity”) is available. On the contrary, Leung discloses that the Home Agent HA1 206 (identified in the Final Office Action as being “the first access node” of claim 1) must still emulate the virtual Home Agent HAV1 202 (identified in the Final Office Action as being “the first mobility entity” of claim 1) to maintain a connection to the mobile node 6 even though it also emulates the second virtual Home Agent HAV2 208. (*See, e.g.*, col. 8, lines 55-59 of Leung). As such, by virtue of teaching that the backup Home Agent still maintains its role in servicing its own group, Leung cannot anticipate claim 3. Accordingly, the rejection of claim 3 must be withdrawn.

d) Claim 4

Claim 4 is patentable over Leung at least by virtue of its dependency from claim 1 and for the additional features recited therein. In particular, Leung is clearly silent as to a method wherein, among other things, “an agent advertisement message is sent from said second mobility entity to said one mobile node over said new connection, said agent advertisement message enabling said one mobile node to detect a change of attachment point and to initiate mobile IP registration.”

The Examiner alleged that these features are disclosed in Leung at col. 4, lines 34-54. Appellant respectfully disagrees. Leung merely discloses at col. 4, lines 34-54 that while operating in its standby capacity, the standby mobility agent periodically receives registration entries from the active mobility agent by UDP. However, there are no indications in the cited portion of Leung, nor anywhere else in Leung, that an agent advertisement message is sent from the second mobility entity (identified in the Final Office Action as being “the virtual Home Agent HAV2 208”) to the mobile node 6 over the new connection, the agent advertisement message enabling the mobile node 6 to detect a change of attachment point and to initiate mobile IP registration.

Accordingly, for at least these reasons, Leung cannot anticipate claim 4. Therefore, the rejection of claim 4 must be withdrawn.

e) Claim 10

Claim 10 is patentable over Leung for at least similar reasons as provided above in connection with claim 1 and for the additional features recited therein.

For at least similar reasons as provided above, Leung does not disclose, teach or suggest an access system comprising a plurality of mobile nodes; a first and a second access node serving the mobile nodes within first and second parts of the access system, respectively; at least one first gateway node for interfacing the first part of the access system with external networks; a first mobility entity which is associated with the at least one first gateway node and arranged to route a connection to any one of the mobile nodes while the mobile node is registered to the first part of the access system; a mechanism which checks whether there is a second mobility entity which is more preferred in respect to routing than the first mobility entity for the one access node; and a mechanism which opens a new connection from one of the access nodes to the second mobility entity if the more preferred second mobility entity is available according to the checking, the mobile node being arranged to detect a change of attachment by means of the new connection and to initiate macro mobility management registration, as recited in claim 1.

f) Claim 21

Claim 21 is patentable over Leung for at least similar reasons as provided above in connection with claim 1 and for the additional features recited therein.

For at least similar reasons as provided above, Leung does not disclose, teach or suggest an access node for an access system comprising a plurality of mobile nodes, access nodes serving said mobile nodes within respective parts of the access system, at least two gateway nodes for interfacing the access system with external networks, and at least two mobility entities which are associated with different ones of the at least two gateway nodes and arranged to provide macro mobility management routing services to the mobile nodes while registered to the access system, the access node comprising: means for checking, when a mobile node having a connection through another access node and a first mobility entity is accessing the system via the access node, whether there is another mobility entity which is more preferred in respect of routing than the first mobility entity, and means responsive to the checking means for opening a new connection to the preferred other mobility entity if the more preferred other mobility entity is available.

Furthermore, Appellant respectfully submits that Leung is silent as to at least two gateway nodes for interfacing the access system with external networks, and at least two mobility entities which are associated with different ones of the at least two gateway nodes and arranged to provide macro mobility management routing services to the mobile nodes while registered to the access system, as recited in claim 21. The Examiner identified in the Final Office Action virtual Home Agent HAV2 208, Home Agent HA1 206, virtual Home Agent HAV1 202 and R1 as, respectively, the “second mobile entity,” “the first access node,” the “first mobility entity” and the “first gateway node.” However, as can be seen in FIG. 2B, Leung merely discloses one router R1 associated with the Home Agent HA1 206. Leung does not disclose, teach or suggest a second gateway node, nor does Leung disclose a second router connected to the virtual Home Agent HAV2 208.

For at least these reasons, Leung cannot anticipate claim 21. Therefore, the rejection of claim 21 must be withdrawn.

g) Claim 22

Claim 22 is patentable over Leung at least by virtue of its dependency from claim 21 and for the additional features recited therein. In particular, Leung is clearly silent as to a means for closing a connection to the first mobility entity when the more preferred other mobility entity is available.

As mentioned previously, the Examiner identified virtual Home Agent HAV2 208, Home Agent HA1 206, and virtual Home Agent HAV1 202 as being, respectively, the “second mobile entity,” “the first access node” and the “first mobility entity” of claim 22.

However, there are no teachings or suggestions anywhere in Leung as to closing a connection from the Home Agent HA1 206 to the virtual Home Agent HAV1 202 when the virtual Home Agent HAV2 208 is available.

First, as mentioned previously, Leung does not disclose any “connection,” but merely “emulation,” between a virtual Home Agent HAV1 202 and the Home Agent HA1 206 or between the Home Agent HA1 206 and the virtual Home Agent 208.

Second, Leung is completely silent as to the possibility of “closing” an emulation between the Home Agent HA1 206 (identified in the Final Office Action as being “the first access node” of claim 1) and the virtual Home Agent HAV1 (identified in the Final Office

Action as being “the first mobility entity” of claim 1) when the virtual Home Agent HAV2 208 (identified in the Final Office Action as being “the second mobility entity”) is available. On the contrary, Leung discloses that the Home Agent HA1 206 (identified in the Final Office Action as being “the first access node” of claim 1) must still emulate the virtual Home Agent HAV1 202 (identified in the Final Office Action as being “the first mobility entity” of claim 1) to maintain a connection to the mobile node 6 even though it also emulates the second virtual Home Agent HAV2 208. (See, e.g., col. 8, lines 55-59 of Leung). As such, by virtue of teaching that the backup Home Agent still maintains its role in servicing its own group, Leung cannot anticipate claim 3. Accordingly, the rejection of claim 21 must be withdrawn.

h) Claim 35

Claim 35 is patentable over Leung for at least similar reasons as provided above in connection with claim 1 and for the additional features recited therein.

For at least similar reasons as provided above, Leung does not disclose, teach or suggest a packet radio support node for a packet radio access system comprising a plurality of mobile nodes, packet radio support nodes serving the mobile nodes within respective parts of the access system, at least two gateway nodes for interfacing the packet radio access system with external networks, and at least two foreign agents which are associated with different ones of the at least two gateway nodes and arranged to provide macro mobility management routing services to the mobile nodes while registered to the packet radio access system, the packet radio support node comprising means for checking, when a mobile node having a connection through another packet radio access node and a first foreign agent is accessing the system via the packet radio access node, whether there is another foreign agent which is more preferred for the packet radio access node in respect of routing than the first foreign agent; and means responsive to the checking means for opening a new connection to the preferred other foreign agent if the more preferred other foreign agent is available.

Furthermore, Appellant respectfully submits that Leung is silent as to at least two gateway nodes for interfacing the access system with external networks, and at least two foreign agents which are associated with different ones of the at least two gateway nodes and arranged to provide macro mobility management routing services to the mobile nodes while registered to the packet radio access system, as recited in claim 21. The Examiner identified in the Final Office Action virtual Home Agent HAV2 208, Home Agent HA1 206, virtual

Home Agent HAV1 202 and R1 as, respectively, the “second mobile entity,” “the first access node,” the “first mobility entity” and the “first gateway node.” However, as can be seen in FIG. 2B, Leung merely discloses one router R1 associated with the Home Agent HA1 206 and one Foreign Agent 10 associated with the network section 14. Leung does not disclose, teach or suggest at least two gateway nodes for interfacing the access system with external networks, and at least two foreign agents which are associated with different ones of the at least two gateway nodes and arranged to provide macro mobility management routing services to the mobile nodes while registered to the packet radio access system, as recited in claim 35.

For at least these reasons, Leung cannot anticipate claim 35. Therefore, the rejection of claim 35 must be withdrawn.

V. CONCLUSION

For at least the reasons discussed above, it is respectfully submitted that claims 1-4, 10, 21-22 and 35 are not anticipated or rendered obvious by the cited reference. For the above reasons, Appellant respectfully requests this Honorable Board to reverse the rejections of claims 1-4, 10, 21-22 and 35.

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VI. CLAIMS APPENDIX - 37 C.F.R. §41.37(c)(1)(viii)

Claims 1-4, 21-22 and 35 are as follows:

1. A method of providing macro mobility management for a mobile node in an access system comprising a plurality of mobile nodes, a first and a second access node serving said mobile nodes within first and second parts of the access system, respectively, at least one first gateway node for interfacing said first part of the access system with external networks, and a first mobility entity which is associated with said at least one first gateway node and arranged to provide macro mobility management routing services to the mobile nodes while registered to the first part of the access system, said method comprising:

establishing a session between one of said plurality of mobile nodes and a second party via said first access node and said first mobility entity;

checking whether there is at least one second mobility entity to which the first access node can establish a connection as an alternative for the first mobility entity and which is more preferred for the first access node in respect of routing than said first mobility entity; and

reacting to said checking by

A) maintaining a connection from said first access node to said first mobility entity if there is no second mobility entity which is more preferred than said first one, and

B) opening new connection from said first access node to said second mobility entity if said more preferred second mobility entity is available, and initiating macro mobility management registration.

2. The method according to claim 1, comprising rerouting the session via said second access node in response to a movement of said one of mobile nodes to said second part of the access system.

3. The method according to claim 1, comprising closing the connection from said first access node to said first mobility entity when said more preferred second mobility entity is available.

4. The method according to claim 1, wherein said macro mobility management is Internet Protocol-type, or IP-type mobility management, and wherein an agent advertisement

message is sent from said second mobility entity to said one mobile node over said new connection, said agent advertisement message enabling said one mobile node to detect a change of attachment point and to initiate mobile IP registration.

10. An access system, comprising
a plurality of mobile nodes;
a first and a second access node serving said mobile nodes within first and second parts of the access system, respectively;
at least one first gateway node for interfacing said first part of the access system with external networks;
a first mobility entity which is associated with said at least one first gateway node and arranged to route a connection to any one of said mobile nodes while said mobile node is registered to the first part of the access system;
a mechanism which checks whether there is a second mobility entity which is more preferred in respect of routing than said first mobility entity for said one access node; and
a mechanism which opens a new connection from one of said access nodes to said second mobility entity if said more preferred second mobility entity is available according to said checking,
said mobile node being arranged to detect a change of attachment by means of said new connection and to initiate macro mobility management registration.

21. An access node for an access system comprising a plurality of mobile nodes, access nodes serving said mobile nodes within respective parts of the access system, at least two gateway nodes for interfacing the access system with external networks, and at least two mobility entities which are associated with different ones of said at least two gateway nodes and arranged to provide macro mobility management routing services to the mobile nodes while registered to the access system, said access node comprising:

means for checking, when a mobile node having a connection through another access node and a first mobility entity is accessing the system via said access node, whether there is another mobility entity which is more preferred in respect of routing than said first mobility entity, and

means responsive to said checking means for opening a new connection to said preferred other mobility entity if said more preferred other mobility entity is available.

22. The access node according to claim 21, comprising means for closing a connection to said first mobility entity when said more preferred other mobility entity is available.

35. A packet radio support node for a packet radio access system comprising a plurality of mobile nodes, packet radio support nodes serving said mobile nodes within respective parts of the access system, at least two gateway nodes for interfacing the packet radio access system with external networks, and at least two foreign agents which are associated with different ones of said at least two gateway nodes and arranged to provide macro mobility management routing services to the mobile nodes while registered to the packet radio access system, said packet radio support node comprising:

means for checking, when a mobile node having a connection through another packet radio access node and a first foreign agent is accessing the system via said packet radio access node, whether there is another foreign agent which is more preferred for said packet radio access node in respect of routing than said first foreign agent; and

means responsive to said checking means for opening a new connection to said preferred other foreign agent if said more preferred other foreign agent is available.

VII. EVIDENCE APPENDIX – 37 C.F.R. § 41.37(c)(1)(ix)

None.

VIII. RELATED PROCEEDINGS APPENDIX – 37 C.F.R. § 41.37(c)(1)(x)

None.